

### **Remarks**

The Applicants acknowledge the objection to Claims 4 – 5 and 9 – 10 under 37 C.F.R. §1.75(c). The Applicants have amended those claims to remove the multiple dependencies. Examination on the merits is respectfully requested.

The Applicants have amended Claims 1, 2, 6 and 7 as to form. The amendments are not intended to and do not change the scope of the protection sought by those claims. The changes are merely made to place them into better form for allowance.

The Applicants acknowledge the rejection of Claim 1 – 3 and 6 – 8 under 35 U.S.C. §103 over the hypothetical combination of JP ‘072 with JP ‘349. The Applicants first observe that the Official Action apparently relies on an Abstract machine translation of JP ‘349. The Applicants enclose an English Abstract published by the JPO for the Examiner’s convenience.

The Applicants respectfully submit that Claim 1 – 3 and 6 – 8 are patentable over JP ‘349 and JP ‘072, whether taken individually or collectively. In that regard, JP ‘349 discloses the production of coke for metallurgical use, which has gas reactivity. The Applicants agree that JP ‘349 does not specifically teach using the Applicants’ claimed caking coal having medium rank and low fluid in which a content of inert component is 30 vol% or more. However, the Applicants respectfully submit that JP ‘349 utterly fails to disclose, teach or suggest other portions of the subject matter recited in Claims 1 – 3 and 6 – 8. For example, Claim 1 recites that the content ratio of pores having a diameter of 10  $\mu\text{m}$  is from 12 vol% to 15 vol% and the content ratio of pores having a diameter from 10  $\mu\text{m}$  to 100  $\mu\text{m}$  is from 10 vol% to 15 vol%. This is nowhere disclosed, taught or suggested in JP ‘349.

There may be some confusion as to the disclosure of JP ‘349, wherein various particle diameters are disclosed in that publication. However, the subject matter of Claims 1 – 3 and 6 –

8 does not concern itself with particle diameters. What those claims do recite is pore diameters, not particle diameters. Pore diameters and particle diameters are very, very different things and have no relationship to one another at all. Careful scrutiny of the JP '349 Abstract reveals that there is not only no emphasis placed on pore diameters, but that pore diameters are not mentioned at all. Only particle diameters are mentioned and those are completely different from pore diameters. Accordingly, the Applicants respectfully submit that JP '349 is inapplicable to not only Claim 1, but to Claims 2, 3 and 6 – 8 for the same reasons.

JP '072, while also relating to production of coke, still fails to provide teachings or suggestions to one of ordinary skill in the art that would lead to the subject matter of Claims 1 – 3 and 6 – 8. JP '072 at least has the advantage that it mentions high porosity. It further mentions a pore-forming agent. However, it does not mention the pore diameters. In sharp contrast, JP '072 discloses particle sizes, not pore sizes. The Applicants accordingly respectfully submit that JP '072 is inapplicable.

Inasmuch as JP '349 and JP '072 both fail to provide one word of disclosure concerning pore diameters, the Applicants respectfully submit that those publications are non-enabling as prior art. Not only do they collectively fail to disclose, teach or suggest the specifically claimed pore diameters in the specifically claimed content ratios, they utterly fail to mention pore diameters or content ratios at all. Therefore, even if one of ordinary skill in the art were to make the hypothetical combination, there would be no clue to the person of ordinary skill in the art as to what the pore diameters could or would be or what their content ratio could or would be. This is simply because both publications are non-enabling with respect to Claims 1 – 3 and 6 – 8. Withdrawal of the rejection of Claims 1 – 3 and 6 – 8 is respectfully requested.

The Applicants respectfully submit that there is another significant difference of Claims 1 – 3 and 6 – 8 over JP ‘349 and JP ‘072 whether taken individually or collectively. Particularly, both of JP ‘349 and JP ‘072 fail to disclose, teach or suggest the claimed relationship between the pore size distribution of coke and the strength or reactivity of the coke. Careful scrutiny of both publications reveals that this important aspect of those solicited claims is not even appreciated, much less taught or suggested.

The Applicants’ Specification makes this connection in a compelling way that neither of JP ‘349 or JP ‘072 have any appreciation for. The Applicants particularly invite the Examiner’s attention to page 16, beginning at line 8 and extending for a number of paragraphs, wherein the Applicants describe the preparation of various cokes having different pore sizes, those pore sizes being within the claimed range and outside of the claimed range. Those cokes were then evaluated for reactivity and strength. One of the evaluated categories, namely cold strength value  $TI_6$  is particularly revealing. When the pore size distribution was in accordance with the ranges claimed herein, the  $I_{RI=25\%}$  value was 65.0 or more. On the other hand, when the pore size distribution was outside of the ranges recited in Claims 1 – 3 and 6 – 8, those values were significantly inferior.

The point of this discussion is that neither of JP ‘349 nor JP ‘072 having any appreciation between the pore size diameter of the coke and the strength or the reactivity of the coke as recited in Claims 1 – 3 and 6 – 8. Thus, even if one of ordinary skill in the art were to make the hypothetical combination, the resulting hypothetical combination would still fail to teach or suggest the claimed pore size distribution which results in the claimed high reactivity and high strength blast furnace coke. Withdrawal of the rejection is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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## PATENT ABSTRACTS OF JAPAN

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C10B 57/04**(21) Application number: **06059070**(71) Applicant: **NIPPON STEEL CORP**(22) Date of filing: **29 . 03 . 94**(72) Inventor: **KATO KENJI  
SASAKI MASAKI  
KOMAKI IKUO****(54) PRODUCTION OF COKE FOR METALLURGICAL  
USE****(57) Abstract:**

**PURPOSE:** To obtain high-strength coke for metallurgical use excellent in gas reactivity, by dry distillation of formed coke produced by incorporating specific powder coal with a caking agent such as coal tar using a vertical dry distillation oven followed by pressure molding.

**CONSTITUTION:** Firstly, particle size regulation of slightly non-caking coal 50-80% in caking index and 10-25wt.% or less in volatiles is conducted so as to be 50-100wt.% in the content of the particle diameters of  $\leq 0.6\text{mm}$  and 50-0wt.% in the content of the particle diameters of 0.6-3.0mm, and 10-70wt.% of the resultant slightly non-caking coal is blended based on the whole feedstock coal for the final formed coke. Second, particle size regulation of slightly non-caking coal 50-80% in caking index and 25-35wt.% in volatiles is conducted so as to be 80-100wt.% in the content of the

particle diameters of  $\leq 0.6\text{mm}$  and 20-0wt.% in the content of the particle diameters of 0.6-1.0mm, and 0-80wt.% of the resultant slightly non-caking coal is blended based on the whole feedstock coal for the final formed coke. Third, particle size regulation of caking coal 80-95% in caking index and 15-30wt.% in volatiles is conducted so as to be 80-100wt.% in the content of the particle diameters of  $\leq 0.6\text{mm}$  and 20-0wt.% in the content of the particle diameters of 0.6-1.0mm, and 50-10wt.% of the resultant caking coal is blended based on the whole feedstock coal for the final formed coke. Finally, the resultant powder coal is incorporated with a caking agent consisting of at least one kind selected from coal tar, pitch and petroleum-based heavy oil followed by pressure molding into formed coal, which is, in turn, subjected to dry distillation with a vertical type dry distillation oven, thus obtaining the objective metallurgical formed coke.

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